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THESIS

ANALYSIS OF THE PREDICTIVE ACCURACY OF THE
RECRUITER ASSESSMENT BATTERY

by

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March 2005

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ANALYSIS OF THE PREDICTIVE ACCURACY OF THE RECRUITER
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I. INTRODUCTION

A. BACKGROUND

Recruiting has always been an area of major interest and concern to the Navy, especially since 1973 and the beginning of the All-Volunteer Force. The current trend in the Navy is to do more with less, and that approach also applies to recruiting. Indeed, recruiting can be a very challenging assignment for a sailor, particularly when the Navy must compete with civilian jobs in a growing economy. To maintain the number and quality of new recruits with the minimum number of recruiters, the Navy needs a method for selecting recruiters who have the highest probability of success. This would enable the Navy use its recruiters in a most efficient and effective manner, while allowing those who might be less suited for recruiting duty to serve elsewhere.

The Recruiter Assessment Battery (RAB) is a predictive test being developed by Navy Personnel Research Studies and Technology (NPRST) to aid in the selection of Navy recruiters. It is designed to capture personality and vocational interests that are important to being a successful recruiter. The RAB is an online test composed of 109 questions and statements. The sailor responds to the series of questions and statements from which a score is derived. Ideally, the higher the RAB score, the higher the probability that one will be a successful recruiter.

B. OBJECTIVE

The objective of this thesis is to assess the predictive ability of the RAB. The performance of

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recruiters is compared with their RAB scores, demographic characteristics, and NRD characteristics using multivariate models. Models are estimated to determine the relationship between RAB scores and recruiter productivity. Possible causes for recruiter misclassification (e.g., a bad prediction) is also considered and to determine ways of improving the RAB based on the results of the models.

To perform this analysis, data were gathered from Commander, Navy Recruiting Command (CNRC) and the Defense Manpower Data Center (DMDC) for a sample of recruiters on duty in 2003. Data on the recruiters RAB score, monthly production, and NRD characteristics were obtained from CNRC. Demographic information on the recruiters was obtained from DMDC.

C.   LIMITATIONS

The analysis is limited by several factors. The recruiters in this study were working during a period when recruiting was relatively easy. This may reduce the effects of some factors, since recruiters may be able to be successful even though they lack some of the traits of a typically successful recruiter. Alternately, a successful recruiter may not recruit to his or her full potential as the station or District may have achieved its monthly quota early. For example, a recruiter may have been able to entice four individuals to join the Navy in a month, but, since the station or District achieved its goal after the recruiter signed up two individuals, the recruiter would only record two new contracts in the month instead of four. A less effective recruiter, who may have normally only found one person to join the Navy, may have been able to

sign up one of the individuals the more successful recruiter did not. This would increase the recruiter's contracts to two when he or she would have only had one. Thus, the effects seen in the models of this study may not be as accurate as they would be in a period when recruiting is relatively difficult. There is also limited variation in the NRD attributes used; with only 31 recruiting districts, the variation in the data is relatively small, which reduces its explanatory power.

D.   ORGANIZATION

Chapter II presents a review of previous studies conducted in developing the Recruiter Assessment Battery. Chapter III is a description of the data and methodology used in the study. Chapter IV presents the analysis of the data and results of the regression models estimated. Chapter V contains the summary, conclusions, and recommendations of the study.

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II. HISTORY AND DEVELOPMENT OF THE RECRUITER ASSESSMENT BATTERY

The Recruiter Assessment Battery (RAB) was developed to help the Navy better select its recruiting force. The premise behind it is to have a test that can be administered to candidates for recruiting duty to predict if they would be good recruiters. The candidate takes the test, which is comprised of questions that relate to underlying constructs of an effective recruiter. The answers to the questions should indicate how well a person fits the constructs of a successful recruiter. The individual's score, if the test is valid, predicts how well one would do as a recruiter. Ideally, the higher an individual scores, the higher the probability that he or she will be a good recruiter.

The RAB was developed using Industrial/Organizational (I/O) psychology principles and methodology. This was done to produce an instrument that can be shown quantitatively to aid in the selection of effective recruiters and not just a test that one feels or believes is useful. It must be able to predict recruiter effectiveness better than would have occurred if recruiters were selected randomly. This section briefly describes the history and development of the recruiter selection instrument that came to be called the RAB.

One of the first studies relating to the RAB began in 1979. It was initiated by the Navy Personnel Research and Development Center (NPRDC) in response to a difficult recruiting environment and the need to select higher quality recruiters. NPRDC contracted the Personnel

Decisions Research Institute (PDRI) to develop an instrument to aid in recruiter selection (Borman, Toquam, and Rosse, 1979).

Borman et al. (1979) review previous studies conducted in developing recruiter selection devices. The first selection battery study was developed in 1960 by Wollack and Kipnis (1960). Their battery contained measures of fluency of expression, knowledge of the Navy, interest in recruiting activities, and general aptitude. Later, in 1972 Krug (1972) used and experimental inventory called the "16PF Personality Inventory" for predicting recruiter success (Borman et al., 1979). In 1973, Abrahams, Neumann, and Rimland administered the Strong Vocational Interest Bank (SVIB) aimed at developing a Recruiter Interest Scale (RIS) to aid in selecting recruiters (Borman et al., 1979).

PDRI's goal was to create a paper-and-pencil test that would predict a sailor's effectiveness as a recruiter. To aid in the development of the criteria, PDRI used self, peer, and supervisor ratings along with actual recruiter production data. They analyzed the supervisor ratings and performance data and compared them to the results of the test battery to check the validity of the instrument and relevance of the criteria (Borman et al., 1979).

The first part of the study was a pretest of the trial battery and performance rating scales using 62 Navy recruiters from NRD Detroit and NRD St. Louis. Based in part on the work done in previous studies, a trial battery of personality, vocational interest, and biographical items was produced. The trial battery was administered to the 62 recruiters, and three sets of performance ratings (self,

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peer, and supervisor) were obtained for each recruiter on 28 different dimensions. Six months of production data were also obtained for 54 of the 62 recruiters. After analyzing the pretest data, adjustments were made to the test battery based on the responses. The performance rating scales were reduced from 28 to 17 dimensions. Five performance criteria were found in the pretest as important in predicting recruiter effectiveness. They were (Borman et al., 1979):

1) Prospecting and selling

2) Planning, Organizing, and Administrative skills

3) Developing Good Navy-Community Relations and Expending Extra Effort to Aid Prospects or Recruits

4) Overall Effectiveness as a Recruiter

5) Production

A concurrent validity research design was used to check the validity of the instrument for the main study. A concurrent validity design is one in which the test is given to people already performing the job and compares their test outcome with their job performance to assess the test's predictive ability (Muchinsky, 2003). The main study used a sample of 267 Navy recruiters from ten NRDs. Again, the battery was given to the recruiters, and the recruiters were rated on 17 dimensions by a supervisor, peer, and themselves. Six months of production information was also gathered for each participant. Thus, for each recruiter, PDRI collected self, peer, and supervisor ratings; responses to the test battery; and production information (i.e., number of people brought into the Navy) (Borman et al., 1979).

PDRI first analyzed the performance ratings. They checked the ratings for inter-rater agreement, leniency,

restriction of range, and halo errors. Inter-rater agreement is "The degree of agreement among the assessments of two or more raters" (Muchinsky, 2003). Leniency error occurs when "The rater assesses a disproportionately large number of ratees as performing well or poorly in contrast to their true performance" (Muchinsky, 2003). Restriction of range error occurs when the difference between the highest ratings and lowest ratings is relatively small in relation to the ratees' actual performance range (Muchinsky, 2003). Halo error occurs when a ratee is given a good performance rating in all areas based on good performance in only a few areas (Muchinsky, 2003). Some degree of halo error appeared to be present. Inter-rater agreement was sufficient (median r =.57) (Borman et al., 1979). Factor analysis was used to look for underlying relationships between the rating dimensions. A three-factor solution was found as the most effective. The names given to the factors were very similar to those from the pretest: Selling Skills, Human Relations Skills, and Administrative Skills (Borman et al., 1979).

The production data were employed to develop a production index to be used as a fourth criterion. The production index is the mean number of accessions per month for each recruiter adjusted for the district in which he or she worked. This adjustment was made by standardizing each recruiter's production within the NRD. The last criterion was overall performance and was used as summary of total performance. Thus, the five criteria developed from this study were (Borman et al., 1979):

1) Selling Skills

2) Human Relations Skills

3) Administrative Skills

4) Production Index

5) Overall Performance

The results of the recruiter test answers were then compared with the five performance criteria to see if the battery was useful in predicting recruiter effectiveness. The estimated cross-validities between the predictor composites and the five performance criteria were statistically significant except for production. The estimated validity coefficients for the final composites were as follows: Selling Skills (.24), Human Relation Skills (.17), Administrative Skills (.31), Overall Performance (.22). These were calculated by pooling the intercorrelations of predictor composites and estimated validities and applying a formula that calculated the estimated cross-validity of the combined composites. Based on the results of the comparison, it was determined that the test had potential to positively aid in the selection of recruiters (Borman et al., 1979).

A follow-up study was conducted in 1981 by PDRI to "expand and refine this test battery and to determine its validity for predicting various dimensions of recruiter performance." (Borman, Rosse, and Toquam, 1981) The revised test battery contained additional experimental items thought to be related to the underlying constructs. It was given to 194 Navy recruiters in seven locations. Supervisor and peer ratings, along with six months of production data, were collected to measure recruiter success. It was concluded that the new battery effectively aided in the prediction of recruiter performance. PDRI

recommended that the Navy implement the battery as part of the selection process for recruiters (Borman et al., 1981). Apparently, it was never implemented, probably because the recruiting environment became more favorable and less of a premium was placed on selecting high quality recruiters.

The interest in developing a recruiter selection device for the Navy surfaced again in the late 1990s and early 2000s, due to the difficult recruiting environment. The Navy sponsored Navy Personnel Research Studies and Technology (NPRST) to develop a way to identify sailors who would be effective recruiters. Again, PDRI was contracted to aid in the research of a paper-and-pencil predictor battery.

PDRI carried out a two-phase project to develop and validate a test battery that could be used to select recruiters. The first phase included "the validation of several instruments thought to be associated with recruiter performance" (Penny and Borman, 2003) and built on the previous work done in the late 1970s and early 1980s. The purpose of the second phase of the project was:

> . . . revising the initial test battery based on the results from the first phase of the project and validating the revised battery in a different sample of recruiters, using a concurrent validation design. (Penny and Borman, 2003)

Phase one of the study was a predictive validation design. A predictive validation design is one where individuals are given the test before they perform on the job to predict their performance level. Then, their performance is compared with their test score to see how well the test predicts job performance (Muchinsky, 2003). The recruiters were given the test battery while in their

first week of training at Navy Orientation Recruiting Unit (NORU), Pensacola, Florida. Then, performance ratings and production data were collected to measure actual performance. As with previous studies, the researchers used performance ratings and production as measures to check the validity of the criteria.

The performance rating scales included eight behavioral dimensions. A rater training program was also developed to ensure that ratings were as consistent and error-free as possible. PDRI obtained performance ratings for 134 recruiters rated by 41 supervisors. The recruiters were from Atlanta, Dallas, Los Angles, Nashville, and Richmond NRDs.

PDRI then performed a factor analysis of the ratings. They felt a three-factor solution provided the best interpretation of the data. The three factors were named Selling Skills, Human Relation Skills, and Organizing Skills, the same as in the previous work.

Production data were obtained from July 2001 through June 2002, and a production index was developed as a measure of recruiter performance. The recruiters' mean production per month, adjusted for differences in Regions, was used as this measure. The production index was developed to correct for seasonal factors, environmental factors within Regions, and the varying amounts of data available. The production index was created by first standardizing production values within each month to correct for seasonal differences before forming a monthly standardized average. Then environmental factors where accounted for by standardizing production values within the

Region.   Finally, those with less than four months of production data were screened out (Penny and Borman, 2003).

Personality, Vocational Interest, and Emotional Intelligence measures were used in the predictor test battery. PDRI collected test data from 623 Navy students while in their first week of training at the Navy Orientation Recruiting Unit (NORU) between July and November 2001. To shorten the length of the test at NORU's request, the Emotional Intelligence portion of the test was dropped. So, validation analysis was not performed on the Emotional Intelligence portion. The test data were also screened for inconsistent or careless responses and 39 participants were removed from the dataset. PDRI then analyzed the test and performance data. The test scores were correlated with the three rating factors and the production index. The researchers used this information to revise the test battery for Phase II of the study (Penny and Borman, 2003).

In the second phase of the study, a concurrent validity approach was used. The test was revised to maximize validity and reduce the time needed to take the test to around 30 minutes. This version of the test was named the Recruiter Assessment Battery (RAB). PDRI collected performance ratings by their peers and supervisors for 278 recruiters from the Montgomery, Omaha, and San Antonio NRDs. The researchers also collected production data on the recruiters and created a production index the same as in the first phase. The RAB was administered to 254 of the recruiters from three NRDs (Penny and Borman, 2003).

Similar results were found in the concurrent validation as were found in the predictive validation performed in phase one. Significant correlation was found between the test scores and the performance criteria of Selling Skills, Human Relations Skills, Organizing Skills, Overall Performance, and Production (Penny and Borman, 2003).

The latest study conducted on the RAB was a concurrent validation performed by Commander, Navy Recruiting Command (CNRC) in April of 2004. The RAB was now a web-based test made up of 109 questions and statements to which the member responded. The RAB was Web-enabled with automated scoring by NPRST and the Space and Naval Warfare Systems Command (SPAWAR) Center in San Diego. This allowed scores to be linked to individual recruiters (CNRC Report, 2004). CNRC identified recruiters who had been in a production status for at least twelve months and ranked them in quartiles based on gross contract production within each district. Next, 1,101 recruiters took the RAB online and were placed in quartiles based on their RAB score. The RAB correctly predicted the production quartile for 30 percent of the recruiters. Based on a chi-squared test, the relationship between the RAB quartile and the production quartile was statistically significant (CNRC Report, 2004). The RAB and recruiter data from this report was provided by CNRC for use in this thesis.

A report was published in 2001 by HumRRO/Lewin Group on the cost-effectiveness of using the ASVAB as a selection device for recruiters. The study assessed the ability of the ASVAB and recruiting school grades to predict recruiter success measured in number of high quality recruits. The

study also examined cost-effectiveness models for using predictor models of recruiter performance (McCloy et al., 2001).

The first part of the study estimated models using Recruiting District attributes, recruiter demographics, ASVAB scores, and recruiting training grades scores as explanatory variables and recruiter production as the dependent variable. The researchers found that sailors' ASVAB scores and recruiting school grades did not aid much in predicting recruiter productivity or quality. Although ASVAB scores and recruiter school scores were statistically significant, their practical effect was small (McCloy et al., 2001).

The cost-effectiveness models attempt to determine if it is cost-effective to administer a predictor test to aid in recruiter selection. The researchers concluded that a predictor test of reasonable validity and administrative cost would be worthwhile (McCloy et al., 2001).

III. DATA DESCRIPTION AND METHODOLOGY

A.   DATA DESCRIPTION

The data set used in this thesis was created by merging three data files. A data set containing the information from CNRC's validation study of the RAB (2004) and a data file containing NRD-level characteristics were obtained from CNRC. Another file was obtained from DMDC that contained the recruiters' demographic information. These three data sets were matched using Social Security Number to create a single file for analytical purposes.

The CNRC-RAB data set includes 1,102 observations. It is the same data set that CNRC used for its validation study of the RAB. It contains each recruiter's paygrade, RAB score, RAB quartile, and performance quartile. Additionally, it contains the production numbers for each month for each recruiter from April 2003 through September 2004.

The NRD data set includes from CNRC contains data for the 31 NRDs in 2003, the same time frame as that of the validation study done by CNRC. It contains the following NRD-level variables: NRD number, Navy new contracts, Navy stations; number of recruiters for the Navy, Marines, Army, Air Force, and Coast Guard; Accessions for the Navy, Marines, Army, and Air Force; military pay, civilian pay, the military-civilian pay ratio; unemployment rate; number of unemployed; size of labor force; veteran population; total male 17-21 year old population; and male 17-21 year old population attending college. It also contains the recruiting goals of each NRD for each month for the period from April 2003 to September 2004.

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The individual demographic data set was created by DMDC by matching the recruiters' Social Security numbers with the data base containing the recruiters' demographic characteristics for fiscal year 2003. DMDC was able to match 1,032 of the 1,102 Social Security numbers. The demographic data set contains the following variables: service, race, gender, ethnicity, home of record state (HORSTATE), home of record country (HORCNTRY), marital status, education, primary occupation code (PRIMOCC), primary military occupational specialty (PRIMMOS), current AFQT percentile (CURRAFQT), current AFQT Category (CURRCAT), Accession AFQT percentile (ACCAFQT), Accession AFQT Category (ACCCAT), rank, date of birth (DOFB), basic active duty service date (BASD), and number of dependents.

These three data files were combined to form the data set used for analysis in this thesis. Each observation contains the recruiter's RAB information, personal demographic characteristics, and the characteristics of the NRD to which they were assigned. As noted, it includes 1,032 observations and the variables listed in the descriptions of the individual data sets above.

After merging the data sets, duplicate variables were removed, such as NRD number, NRD Name, rank, etc. Recruiters who were paygrade E7 and above were removed since their primary duty is supervision and not recruiting. Recruiters with an average production of zero for the 18-month period were also removed since they are clearly not recruiting. Table 1 contains a list of the names and descriptions of the variables in the data set.

Table 1.   Variable Names and Descriptions

Variable Name	Description
ssn	Recruiter SSN
prodquar	Initial Quartile based on Apr-Mar Production
nrd_quar	Combined Initial with NRD adjustment
fullquar	Quartiles based on full tour production by average month
rab_quar	RAB Quartile
total_sc	Total RAB Score
apr03 - sep04	This is a series of 18 variables, one for each month from April of 2003 (apr03) to September of 2004 (sep04). It is the number of new contracts the recruiter wrote in each month.
Gapr03 -Gsep04	This is a series of 18 variables that gives the NRD's goal for each month from April 2003 (Gapr03) through September 2004 (Gsep04).
NRD	NRD number
NRDNAME	Name of the NRD
Navy_New_Contracts	Number of new contracts the NRD wrote in FY2003
Navy_Stations	Number of recruiting stations in the NRD
Navy	Number of Navy recruiters in the NRD in FY2003
Army	Number of Army recruiters in the NRD in FY2003
USMC	Number of Marine recruiters in the NRD in FY2003
Air_Force	Number of Air Force recruiters in the NRD in FY2003
Cost_Guard	Number of Coast Guard recruiters in the NRD in FY2003
Navy1	Number of Navy assessions in the NRD for FY2003
Army1	Number of Army assessions in the NRD for FY2003
USMC1	Number of Marine assessions in the NRD for FY2003
Air_Force1	Number of Air Force assessions in the NRD for FY2003
Miltiary_Pay	Average military pay
Civilian_Pay	Average civilian pay in the NRD
Military	Ratio of average military pay to average civilian pay in NRD
Unemployment_Rate	Unemployment rate for the NRD
Unemployed	Number of unemployed people in the NRD in ones
Labor_Force	Number of people in the labor force in the NRD in ones
Veteran_Population	Number fo veterans in the population of the NRD
Total_Male_17-21	Male 17 to 21 year old population in the NRD
In_College_Male_17-21	Number of 17 to 21 year old males who are in college in NRD
Svc	service Name (e.g., Navy)
Gender	sex of recruiter
Race	Race of recruiter
Ethnicity	Ethnicity of recruiter
HORSTATE	State Home of Record
HORCNTRY	Country Home of Record
Marital	Marital status
Educ	Level of eductaion

Time	Number of months in current paygrade
Primocc	Primary DoD occupation code
Primmos	Primary service occupation code
Curafqt	Most current AFQT percentile quantity
Curcat	Most current AFQT category code
Accafqt	Accession AFQT percentile quantity
Acccat	Accession AFQT category code
Rank	Pay plan grade identifier
DOFB	Date of Birth
BASD	Basic active duty service date
Dependents	Number of dependents

Additional variables were constructed for NRD characteristics and demographic characteristics. Dummy variables were created for gender, marital status, rank, rate, education, Hispanic ethnicity, race, AFQT category, and NRD. A variable was created for average production for the 18-month, period and another variable for the eligible pool of candidates in the population. Variables for the number of Navy recruiters per eligible youth population, number of veterans per eligible population, and the total number of other service recruiters in the NRD were also constructed. The additional variables are shown in Table 2. The final analytical data set contains 987 observations and 179 variables.

Table 2. Additional Variables and Descriptions

Variable	Description
age	Age of recruiter in 2003
female	1 if gender is female, 0 otherwise
white	1 if white and not Hispanic
black	1 if black and not Hispanic
other	1 if other race and not Hispanic
hisp	1 if Hispanic ethnicity
married	1 if married
nontrad	1 if non-traditional HS diploma or less education
HS	1 if High school graduate
coll	1 if some college or higher education
year	Year of birth
entry	Year of entry into service
yrs_svc	Number of years service in 2003
cat1	1 if Category 1 AFQT score
cat2	1 if Category 2 AFQT score
cat3A	1 if Category 3A AFQT score
cat3B	1 if Category 3B AFQT score
cat4	1 if Category 4 or 5 AFQT score
E4	1 if paygrade is E4
E5	1 if paygrade is E5
E6	1 if paygrade is E6
E7	1 if paygrade is E7 or higher
air	1 if in aviation rating
ops	1 if in operations rating
eng	1 if in engineering rating
supp	1 if in supply rating
cb	1 if in Construction Battalion rating (Seabee)
intel	1 if in intelligence or cryptology rating
admin	1 if in other rating field
NRD Dummies	Dummy variable for each NRD 1 if in NRD, 0 otherwise
total_prod	Recruiters total production for 18 month period
avgprod	Average production of recruiter for 18 month period
first_six	Average production for first six months of production
sec_six	Average production for second six months of production
last_six	Average production for last six months of production
Osrec	Number of other services recruiters in the NRD
OSrec_pop	Number of other service recruiters per eligible population
Elig_pool	Number of 17-21 year old males not in college in the NRD
rectr_per_pop	Number of recruiters per eligible persons in the NRD
vets	number of veterans per eligible persons in the NRD

B.   DESCRIPTIVE STATISTICS

Table 3 presents the means of continuous variables and the percentages of the binary variables in the data set. As seen here, the average age of recruiters in the data set is 28.26 years old. The average number of years service is 8.16. The data set contains 104 E4's (10.54 percent), 622

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E5's (63.02 percent), 261 E6's (26.44 percent). There are 902 males (91.39 percent) and 85 females (8.61 percent). There are 376 single members (37.02 percent) and 611 married members (61.09 percent). The average number of dependents is 1.59.

The distribution of the sample by race, ethnicity, and education is shown in Table 4. About 19 percent of the recruiters are Black and about 16 percent are Hispanic. There are 885 High School graduates (89.67 percent), 69 (6.99 percent) with a High School diploma equivalent or less, and 29 who have some college or higher (2.94 percent). The data set contains 33 people in AFQT Category I (3.34 percent), 360 people in Category II (36.47 percent), 205 people in Category IIIA (20.77 percent), 350 people in Category IIIB (35.46 percent), and 25 people in AFQT Category IV (2.53 percent). The RAB scores range from 85 to 215 with a mean score of 166.

The distribution of recruiters by NRD is listed in Table 5. The average monthly production for the eighteen month period was 1.44 contracts per month.

Table 3. Descriptive Statistics of Navy Recruiting District (NRD)-Level Variables and Personal Characteristics of Recruiters in Data Set

Variable (N=987)	Mean	Std Dev	Minimum	Maximum
NRD-Level Variables				
Navy_New_Contracts	1400.5900	361.5446	824.00	2018.00
Navy_Stations	42.8349	7.8553	25.00	60.00
Navy	155.9577	41.2691	89.05	236.69
Army	181.5064	37.1782	107.64	263.07
USMC	86.1439	19.3468	49.69	119.20
Air_Force	48.4333	9.3024	26.08	68.01
Cost_Guard	8.4449	2.9769	3.64	15.48
Navy1	1358.9800	352.9174	797.00	1919.00
Army1	2410.4500	472.0569	1280.00	3666.00
USMC1	1063.8200	228.2539	633.00	1621.00
Air_Force1	1237.1700	269.6954	777.00	1800.00
Miltiary_Pay	257.2850	0.0000	257.29	257.29
Civilian_Pay	413.3820	29.3677	358.23	481.26
Military	0.6255	0.0445	0.53	0.72
Unemployment_Rate	6.1034	0.8614	4.18	7.84
Unemployed	294279.1900	107984.5700	158131.33	554991.08
Labor_Force	4767354.0900	1368546.7300	2821502.00	8218682.25
Veteran_Population	455487.4800	78165.8000	311316.45	647927.14
elig_pool	215518.8700	46488.3700	120256.82	322550.11
OSrec	316.0836	60.8107	183.41	426.32
vets	2.1652	0.3744	1.33	2.95
Total_Male_17	333072.9500	87152.4000	189408.82	533253.11
In_College_Male_17	117554.0800	42896.6600	63332.00	210703.00
Personal Characteristics Variables				
total_sc	166.1368	20.6418	85.00	215.00
age	28.2594	4.5159	22.00	48.00
TIME	34.0314	22.7469	0.00	176.00
DEPENDENTS	1.5876	1.3930	0.00	7.00
CURAFQT	54.5066	24.1820	0.00	99.00
ACCAFQT	57.4276	20.4950	0.00	99.00
yrs_svc	8.1621	3.7030	1.00	19.00
total_prod	26.0253	10.5094	1.00	91.00
avgprod	1.4459	0.5839	0.06	5.06
six_prod	9.4671	4.5035	0.00	37.00
first_six	1.5778	0.7506	0.00	6.17
twelve_prod	8.4164	4.0002	0.00	29.00
sec_six	1.4027	0.6667	0.00	4.83
Lastsix_prod	8.1418	5.2579	0.00	40.00
last_six	1.3570	0.8763	0.00	6.67
female	0.0861	0.2807	0.00	1.00
married	0.6190	0.4859	0.00	1.00
Hisp	0.1581	0.3650	0.00	1.00
white	0.5816	0.4936	0.00	1.00
black	0.1925	0.3945	0.00	1.00
other	0.0679	0.2517	0.00	1.00
E4	0.1054	0.3072	0.00	1.00

E5	0.6302	0.4830	0.00	1.00
E6	0.2644	0.4413	0.00	1.00
cat1	0.0334	0.1799	0.00	1.00
cat2	0.3647	0.4816	0.00	1.00
cat3A	0.2077	0.4059	0.00	1.00
cat3B	0.3546	0.4786	0.00	1.00
cat4	0.0253	0.1572	0.00	1.00
air	0.2290	0.4204	0.00	1.00
eng	0.2300	0.4210	0.00	1.00
ops	0.3475	0.4764	0.00	1.00
supp	0.0618	0.2409	0.00	1.00
cb	0.0476	0.2131	0.00	1.00
intel	0.0426	0.2019	0.00	1.00
admin	0.0415	0.1996	0.00	1.00
nontrad	0.0699	0.2551	0.00	1.00
HS	0.8967	0.3046	0.00	1.00
coll	0.0294	0.1690	0.00	1.00

Table 4.   Number and Percentage Distribution of Recruiters
         in Data Set by Ethnicity, Race, and Education Level

Variable	Frequency	Percent
Ethnicity		
Filipino	24	2.43
Korean	2	0.2
Vietnamese	1	0.1
Other Asian Descent	2	0.2
Mexican	63	6.38
Puerto Rican	12	1.22
Cuban	2	0.2
Latin American	5	0.51
Other Hispanic Descent	76	7.7
Eskimo	1	0.1
US or Canadian Indian Tribes	21	2.13
Other Pacific Islander Descent	4	0.41
Other	8	0.81
None	766	77.61
Race		
White	700	70.92
Black	196	19.86
Asian	42	4.26
American Indian	24	2.43
Unknown	25	2.53
Education Level		
Less than HS Diploma	18	1.82
Secondary School Credential near Completion	1	0.1
Test Based Equivalency Diploma	26	2.63
Occupation Program Certificate	1	0.1
Correspondence School Diploma	1	0.1
Home Study Diploma	2	0.2
Adult Diploma	20	2.03
HS Diploma	885	89.67
One Semester of College	9	0.91

Associate Degree	13	1.32
Bachelors Degree	7	0.71
Unknown	4	0.41

Table 5.   Number and Percentage Distribution of Recruiters
in Data Set by Navy Recruiting District (NRD)

NRD NAME	Recruiters	Percent
Atlanta	32	3.24
Buffalo	14	1.42
Chicago	36	3.65
Dallas	34	3.44
Denver	31	3.14
Houston	25	2.53
Indianapolis	38	3.85
Jacksonville	23	2.33
Kansas City	17	1.72
Los Angeles	53	5.37
Miami	40	4.05
Michigan	44	4.46
Minneapolis	26	2.63
Montgomery	35	3.55
Nashville	33	3.34
New England	8	0.81
New Orleans	26	2.63
New York	39	3.95
Ohio	35	3.55
Omaha	23	2.33
Philadelphia	19	1.93
Phoenix	33	3.34
Pittsburgh	22	2.23
Portland	33	3.34
Raleigh	32	3.24
Richmond	23	2.33
San Antonio	54	5.47
San Diego	39	3.95
San Francisco	47	4.76
Seattle	43	4.36
St. Louis	30	3.04

C.   METHODOLOGY

To analyze the relationship between RAB score and recruiter performance, multivariate models are estimated using Ordinary Least Squares (OLS). Regressions are estimated with the recruiters' average monthly production as the dependent variable and RAB score, personal demographic characteristics, and NRD-level characteristics,

both separately and together, as the explanatory variables. A step-wise approach is used to see how the accuracy of the predictive effect of RAB score is affected by the inclusion of various personal characteristics and NRD characteristics in the regression model, which may be correlated with RAB score. This will also show the degree to which the RAB score captures other factors and the degree to which the RAB has an independent effect on recruiter performance.

The explanatory variables (other than RAB score) used in the model can be separated into two categories: demographic characteristics and NRD-level characteristics. The demographic characteristics are gender, race, marital status, rate, AFQT category, and education level. The NRD-level characteristics are unemployment rate, eligible 17-21 population, military-civilian pay ratio, veteran population, and the number of recruiters from other military services.

D.   VARIABLES

The explanatory variables and their expected effects are discussed below. While all of the variables mentioned here are not used in every model, all the variables used for analysis in this thesis are described below.

As stated previously, the recruiter's average monthly production for the 18-month period from April 2003 through September 2004 is the main dependent variable. Table 3 shows that average monthly production (avgprod) was 1.45 contracts during this period. Also used as dependent variables are the recruiter's average production for the first six months on recruiting duty, for the second six months, and for the last six months of the 18-month period.

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The RAB score variable is the score the individual made when he or she took the RAB test and is continuous in nature, ranging in the sample from 85 to 215. The mean score on the RAB is 166 and the standard deviation is 20.6. It is expected to correlate positively with average production. The RAB was created to measure a person's aptitude for a recruiting job. Thus, to the extent the RAB has predictive validity, the higher a person scores on the RAB the higher the probability that he or she will be successful in recruiting.

The female variable is a dummy for female recruiters. It is expected that being female will have a negative impact, since the Navy recruits mostly males and it will be harder for a female to recruit them than for a male. Male recruiters will probably be better able to relate to male prospects than female recruiters.

Race dummy variables were created for white, black, Hispanic, and for other races, with white as the base case. The race variables could have a positive or negative impact on recruiting success, depending on the racial make-up of the recruiting area. For instance, if a recruiter who is a member of a minority group is recruiting in an area consisting of the same minority, this may have a positive impact. However, if a minority recruiter is stationed in an area with a different racial composition, this may have a negative impact. Since most recruiters will probably be assigned to maximize their potential in the NRD, it is expected that all race variables will have a positive effect on a recruiter's production.

The dummy variable married equals 1 if the recruiter is married. Being married could have either a positive or

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negative effect on recruiting. It could have a negative impact if a married person has less time to devote to recruiting than a single person due to time-consuming family responsibilities. On the other hand, being married may have a positive effect if the recruiter is more likely to make the Navy a career. This will cause married recruiters to have greater commitment and to work hard to ensure their success and promotion, which will ultimately benefit their families. It is expected that the net effect of being married will have a negative impact on recruiting as the married recruiter may be less willing or able to commit the same amount of time and effort to recruiting as will a single recruiter.

The dependent variable is the number of dependents the member has other than his or her spouse. It is expected to have a negative impact on performance as recruiters may be willing to spend less time recruiting if they have more dependents. The assumption is that more dependents means the recruiter will be distracted by other family commitments (medical appointments, school, sports practice, and so on).

Dummy variables for paygrade were created for E4, E5, and E6, with E5 being the base case. Paygrade E4 is expected to have a positive effect since E4s will tend to have less supervisory responsibility and administrative duties and can devote more time to recruiting. They will also tend to be younger and better able to relate to the target population of high school seniors and recent graduates. E6 is expected to have a negative impact, since these individuals have more supervisory responsibility and administrative tasks that take time away from their direct

recruiting duties. They will also tend to be older and may not be able to relate as well to the younger target population.

Dummy variables for seven rating categories were constructed based on primary Military Occupational Specialty (MOS) code in the DMDC data. The seven categories are air (air), engineering (eng), operations (ops), supply (supp), seabee (cb), intelligence (intel), and administrative (admin). Air is the base case. Members were assigned one of these categories based on their rating, except for the administration category which contains the ratings HM, DT, DM, JO, LI, RP, PC, PN, and YN. These were combined, since few of these ratings were represented in the sample of recruiters. The expected effect of the rating variables is unknown. However, the rating dummies are included, since it is expected they will capture some effect or aptitude that is common in each rating category not captured elsewhere, specifically by the RAB.

Variables were created for AFQT category based on the individual's current AFQT category as reported in the DMDC data. Dummy variables were created for four groups: Category I (cat1), II (cat2), IIIA (cat3A), IIIB(cat3B), and IV (cat4). Cat2 is the base case. Cat1 is assumed to have a positive effect on recruiter success, since recruiters should have greater aptitude and more easily adapt to recruiter duty. Cat3A, cat3B, and cat4 are expected to have a negative effect on recruiter success, assuming that these people would have lower aptitude and may have a more difficult time adapting to recruiter duty.

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Dummy variables were constructed for three education levels: less than high school and high school equivalent (nontrad); high school diploma (HS); and those with some college or higher (coll). High School Diploma graduate is the base case. It is expected that non-traditional graduates will have a negative impact on success, because they have less education, which might make it more difficult for them to communicate and adapt to recruiting duty. It also may be harder for them to relate to high school graduates who are the primary population they would be recruiting. Some college is expected to have a positive effect on success assuming recruiters with some college education may be able to communicate better and sell the Navy more effectively.

The unemployment rate (Unemployment_Rate) is the unemployment rate in 2003 for the recruiting district in which the recruiter is working. It is expected to have a positive effect on recruiter success, since the harder it is for young men and women to find a civilian job, as indicated by higher unemployment rates, the easier it is to entice them into joining the Navy.

The eligible pool variable (elig_pool) is the number of 17-to-21 year old males in the NRD in 2003 who are not in college. This variable is expected to have a positive impact on average recruiter production, because a larger pool of candidates would reduce the cost and effort of finding the quota of qualified people.

The veteran population variable (Veterans_Population) reflects the number of veterans in the recruiting district in 2003. It is expected to have a positive impact on

success, assuming that a higher number veterans means a larger overall number of potential influencers in the region.

The Navy variable (Navy) is the number of Navy recruiters assigned to the NRD. This variable could have a positive or negative effect. A proportionately large number of recruiters compared to eligible population in the District could have a negative influence, since Navy recruiters might be competing with each other for contracts. On the other hand, a positive effect might occur if the number of recruiters is proportionately low compared to the eligible population.

The number of recruiters from other military services (Army, Air_Force, and USMC) in the recruiting district (during 2003) is expected to have a negative effect on recruiter success. This is assumed because recruiters from other services would likely be competing with the Navy recruiters.

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IV. RESULTS OF THE STATISTICAL ANALYSIS

Initially, a correlation analysis was performed for the variables used in the models. The correlation coefficients are shown in Appendix A. None of the explanatory variables were highly correlated with RAB score. Being white had the highest correlation with a coefficient of −.10. A moderate correlation was found between the number of Navy and other services recruiters with the eligible population in the districts, which was expected.

The first model estimated was a simple linear regression of average monthly production on RAB score (total_sc). This gives a baseline for the analysis to see how the effect of RAB score changes when additional variables are included in the model that may be correlated with RAB score. The results from the baseline linear regression are shown in Table 6. The F-value shows that this model is statistically significant (p<.0001). The p-values in Table 6 and in subsequent tables are for two-tail tests. RAB score has a positive effect and is statistically significant at the .01 level. The effect of RAB score on recruiter production in this model indicates that scoring ten points higher on the RAB increases average monthly production by .0671 contracts. Thus, using the average recruiter, who scored 166 on the RAB and has a monthly average of 1.44 contracts per month (or 17.28 contracts per year), someone who scored 10 points higher on the RAB would tend to have a monthly average of 1.5 contracts and a yearly average of 18.09 contracts; this amounts to almost one additional recruit per year. A 10-

point increase in RAB score represents a 6-percent increase and the increase in contracts represents about a 5-percent increase; thus, the elasticity of the RAB is roughly 1.0.

Table 6.   Regression of Average Monthly Production on RAB Score

Model					
F Value	58.79				
Pr > F	<.0001				
DF	986				
R-Square	0.0563				
Adj R-Sq	0.0554				
Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	0.33065	0.14657	2.26	0.0243
total_sc	1	0.00671	0.0008755	7.67	<.0001

This simple linear regression shows that a relationship exists between one's RAB score and recruiting productivity.   However, the coefficient of RAB includes both, the direct effect of RAB plus the indirect effects of variables that affect RAB.   To check the robustness and the direct effects of the RAB, we must estimate the model by including other factors that may affect recruiting success. The following regressions add variables representing attributes of the recruiting district (NRD) and characteristics of the individual to see if the effects of the RAB are accounted for by other factors.

Thus, the next step is to estimate a regression model with the NRD-level characteristics included.   The effects of the NRD characteristics are expected to be limited, as the variation in NRD-level factors is limited. However, the variables would hold constant the attributes of the NRD

that may make recruiters in one area more successful than recruiters in another.   Further, note that CNRC assigns recruiters and goals to NRDs based on historical production in the area so that success may not vary systematically across regions. The results of the regression are presented in Table 7.

Table 7.   Regression Results of Average Monthly Production
on RAB Score and NRD-level Characteristics

Model	
F Value	7.83
Pr > F	<.0001
DF	986
R-Square	.0673
Adj R-Sq	.0587

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	-0.07114	0.48321	-0.15	0.8830
total_sc	1	0.00671	0.000877	7.65	<.0001
Unemployment_Rate	1	-0.03759	0.0247	-1.52	0.1284
Veteran_Population	1	8.54E-07	4.42E-07	1.93	0.0536
elig_pool	1	-7.05E-07	7.88E-07	-0.89	0.3715
Military	1	0.82708	0.59412	1.39	0.1642
Navy	1	0.0017	0.000912	1.86	0.0627
Army	1	-0.0019	0.00123	-1.55	0.1225
USMC	1	0.00277	0.00235	1.18	0.2384
Air_Force	1	-0.00582	0.00385	-1.51	0.1308

This model is also statistically significant (p<.0001), but the F-value has dropped compared with the results in Table 6; the R-squared value is slightly higher. RAB score is still statistically significant at the .01 level and its coefficient has the same value (.00671). None of the NRD-level explanatory variables are significant at the .05 level, which explains the drop in F-value. Veteran population and Navy recruiters are statistically

significant at the .10 level. Using a one-tailed test unemployment rate, military-civilian pay ratio, Army, and Air Force recruiters are statistically significant at the .10 level.

Unemployment rate has a negative effect on recruiter production, which is unexpected. This could be caused by several circumstances. One explanation may be due to the war in Iraq, and people being less willing to join the military in a time of war. It may also be due to the relatively low unemployment rate during the period or a lack of variation in the data. A rise in the unemployment rate may still leave the unemployment rate relatively low historically.

In this model for this sample of recruiters the characteristics of the NRD do not have much explanatory power. A joint F-test performed on the NRD-level variables shows that, taken all together, they are not jointly significant; the F-value is 1.43 (p = .177). As another check, a regression model was estimated with just NRD-level variables, but without RAB score to check the explanatory power of the variables. This model was not statistically significant with an F-value of 1.41 (p=0.1894). Thus, the NRD-level characteristics in this sample for this model do not aid in predicting recruiter productivity. RAB score provides almost all of the explanatory power for this model.

Next, a regression is estimated that includes RAB score and the recruiters' individual characteristics. The results of the regression are presented in Table 8. Again, the model F-value indicates that the model is statistically significant (p<.0001); compared with Table 6, the R-squared

increased to .1004. RAB score is statistically significant at the .01 level and the coefficient for RAB score changed only slightly, dropping to .00638.

Table 8.   Regression of Average Monthly Production on RAB
            Score and Personal Characteristics

Model	
F Value	5.39
Pr > F	<.0001
DF	986
R-Square	.1004
Adj R-Sq	.0818

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	0.51917	0.15274	3.4	0.0007
total_sc	1	0.00638	0.00088	7.25	<.0001
female	1	-0.04969	0.06618	-0.75	0.4529
black	1	0.01298	0.05079	0.26	0.7983
Hisp	1	0.10322	0.05139	2.01	0.0449
other	1	0.23318	0.0742	3.14	0.0017
married	1	0.04683	0.03742	1.25	0.2111
nontrad	1	0.01704	0.07155	0.24	0.8118
coll	1	-0.06503	0.10782	-0.6	0.5466
cat1	1	-0.15119	0.10479	-1.44	0.1494
cat3A	1	-0.07758	0.05065	-1.53	0.1259
cat3B	1	-0.10178	0.04627	-2.2	0.0281
cat4	1	-0.13088	0.11952	-1.1	0.2738
E4	1	-0.02727	0.06099	-0.45	0.6549
E6	1	-0.14531	0.0441	-3.3	0.0010
ops	1	-0.11641	0.04917	-2.37	0.0181
eng	1	-0.16607	0.05304	-3.13	0.0018
supp	1	-0.0562	0.0822	-0.68	0.4943
cb	1	-0.16195	0.09027	-1.79	0.0731
intel	1	-0.03808	0.09615	-0.4	0.6921
admin	1	0.04525	0.09728	0.47	0.6419

Only three variables ('other' race, E6, and engineering ratings) are statistically significant at the .01 level using a two-tail test. Hispanic, Cat3B, and operations ratings are statistically significant at the .05 level, while Seabee rating is significant at the .10 level. Using a one-tailed test, Cat1 and Cat3A are significant at

the .10 level. All of the rating variables have a negative impact, meaning that the base case of aviation ratings has a positive effect on recruiter production compared with the other rating categories. Cat1 had a negative impact on recruiting, which was unexpected. This may be due to the small number of Cat1 recruiters in the sample.

As with the NRD characteristics, recruiters' personal characteristics have little effect on the significance and magnitude of the effect of RAB score. A joint F-test of the recruiters' personal characteristics shows that, taken together, the recruiters' individual characteristics are jointly significant with an F-value of 2.49 (p=0.0004).

As another check on the effect of the demographic characteristics, a model was estimated using the personal characteristics, but leaving out RAB score. The F value for this model shows that it is statistically significant (p<.0001). The R-squared was .0515, about half of the value of the model containing RAB score. This may be a source of RAB misclassifications. If a recruiters' RAB score is the only factor used to predict recruiter success it leaves out other personal factors that help to explain recruiter productivity. In the model presented here the explanatory power was doubled by adding personal demographic characteristics.

Finally, a regression was run that includes the RAB score and both the NRD-level and individual characteristics. The results are presented in Table 9. This model is statistically significant (p<.0001). The R-squared value is slightly higher at .1096 than in Table 8. Again, the significance and magnitude of the coefficient of RAB score is relatively unchanged. All of the variables

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have basically the same significance, magnitude and direction as in the separate models in Tables 6 through 8. The sample of recruiters in the data set shows that the RAB seems to capture factors important in predicting recruiter productivity that the other measures do not capture, and that the RAB is not correlated with these other factors. As can be seen in these regressions the coefficient of RAB score remains relatively constant, ranging from .00671 to .00638.

Table 9.   Regression Results of Average Monthly Production
          on RAB Score, NRD Characteristics, and Personal
                         Characteristics

Model	
F Value	4.21
Pr > F	<.0001
DF	986
R-Square	.1096
Adj R-Sq	.0836

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	0.31695	0.48856	0.65	0.5167
total_sc	1	0.00639	0.00088	7.26	<.0001
female	1	-0.05999	0.06626	-0.91	0.3655
black	1	0.02019	0.05245	0.38	0.7004
Hisp	1	0.108	0.05587	1.93	0.0535
other	1	0.23666	0.0758	3.12	0.0018
married	1	0.03904	0.03771	1.04	0.3008
nontrad	1	0.01362	0.07223	0.19	0.8505
coll	1	-0.07308	0.10791	-0.68	0.4984
cat1	1	-0.14438	0.10495	-1.38	0.1692
cat3A	1	-0.07949	0.05087	-1.56	0.1185
cat3B	1	-0.10594	0.04659	-2.27	0.0232
cat4	1	-0.1402	0.12043	-1.16	0.2446
E4	1	-0.01356	0.06157	-0.22	0.8258
E6	1	-0.14879	0.0445	-3.34	0.0009
ops	1	-0.1113	0.04965	-2.24	0.0252
eng	1	-0.1592	0.05356	-2.97	0.0030
supp	1	-0.05093	0.08253	-0.62	0.5373
cb	1	-0.1452	0.09084	-1.6	0.1103
intel	1	-0.03652	0.09636	-0.38	0.7048
admin	1	0.06384	0.09782	0.65	0.5141
Unemployment_Rate	1	-0.03605	0.02467	-1.46	0.1443
Veteran_Population	1	8.75E-07	4.41E-07	1.98	0.0476
elig_pool	1	-9.44E-07	7.98E-07	-1.18	0.2369
Military	1	0.5532	0.59727	0.93	0.3546
Navy	1	0.00135	0.000937	1.44	0.1509
Army	1	-0.00121	0.00124	-0.98	0.3283
USMC	1	0.00153	0.00239	0.64	0.5217
Air_Force	1	-0.00504	0.00388	-1.3	0.1936

To see the relative magnitude of the effects of the
variables, a log-log regression model is estimated that
includes RAB score, NRD, and personal characteristics. The

results of the regression are presented in Table 10. The coefficients of this model represent the elasticities of each variable.

Table 10. Log-Log regression output

Model	
F Value	3.45
Pr > F	<.0001
DF	986
R-Square	.0917
Adj R-Sq	.0651

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	-5.11078	1.92068	-2.66	0.0079
ltotal_sc	1	0.64457	0.1173	5.5	<.0001
female	1	-0.02615	0.0559	-0.47	0.6400
black	1	-0.01701	0.04424	-0.38	0.7007
Hisp	1	0.07483	0.04709	1.59	0.1123
other	1	0.14498	0.06385	2.27	0.0234
married	1	0.03719	0.03183	1.17	0.2429
nontrad	1	0.03678	0.06096	0.6	0.5465
coll	1	-0.04837	0.09106	-0.53	0.5954
cat1	1	-0.06591	0.08853	-0.74	0.4568
cat3A	1	-0.05566	0.04295	-1.3	0.1954
cat3B	1	-0.07713	0.03931	-1.96	0.0500
cat4	1	-0.06567	0.10156	-0.65	0.5181
E4	1	0.01042	0.05195	0.2	0.8411
E6	1	-0.17518	0.03748	-4.67	<.0001
ops	1	-0.07143	0.04186	-1.71	0.0883
eng	1	-0.13104	0.04521	-2.9	0.0038
supp	1	-0.03404	0.06962	-0.49	0.6250
cb	1	-0.10889	0.07665	-1.42	0.1558
intel	1	-0.00132	0.08132	-0.02	0.9871
admin	1	0.04809	0.08249	0.58	0.5600
lunemployment_rate	1	-0.17539	0.12492	-1.4	0.1607
lveteran_population	1	0.37765	0.1654	2.28	0.0226
lelig_pool	1	-0.09656	0.14048	-0.69	0.4920
lmilitary	1	0.23244	0.31142	0.75	0.4556
lnavy	1	0.17033	0.12084	1.41	0.1590
larmy	1	-0.27633	0.20729	-1.33	0.1828
lusmc	1	0.00453	0.16127	0.03	0.9776
lair_force	1	-0.14183	0.15489	-0.92	0.3601

The F-value in Table 10 indicates that the model is statistically significant (p<.0001) with an R squared of

.0917. RAB score has the greatest effect on average monthly production in this model. A 10-percent increase in RAB score yields a 6.4-percent increase in average monthly production, all else held constant. The variable for E6 is also significant at the .01 level. The variables other race, cat3, eng, and veteran population are significant at the .05 level. The variable for operations ratings is negatively significant at the .10 level. Veteran population has the second largest effect in this model, with a one-percent increase in the veteran population resulting in a .377-percent increase in average monthly production.

Three additional regressions were run to take into account the learning curve that characterizes recruiting duty and seasonal factors involved in recruiting. The contract averages over the first six months, second six months and last six months of the 18-month period were used as three alternate dependent variables. The same explanatory variables were used in all of these models. The results of these regressions are presented in Table 11.

Table 11.　Comparison of Six-Month Average Production Models

Model	first six months	second six months	last six months
Intercept	0.09314	0.16569	0.69204
total_sc	0.00761***	0.00616***	0.00541***
female	0.0205	-0.10514	-0.09533
black	-0.00992	0.03507	0.03543
Hisp	0.07491	0.08941	0.15967*
other	0.09703	0.14345	0.46949***
married	0.09319*	0.00914	0.01479
nontrad	0.09044	-0.09988	0.0503
coll	0.08261	-0.00042065	-0.30144*
cat1	-0.30481**	-0.06778	-0.06056
cat3A	-0.05864	-0.04326	-0.13657*
cat3B	-0.08454	-0.1387**	-0.09458
cat4	-0.11202	-0.23177*	-0.07679
E4	-0.01882	0.00354	-0.02539
E6	-0.091	-0.13574***	-0.21962***
ops	-0.09745	-0.10759*	-0.12887*
eng	-0.08666	-0.14212**	-0.24883***
supp	0.03372	-0.08375	-0.10276
cb	-0.2167*	-0.12765	-0.09125
intel	-0.06749	-0.0027	-0.03937
admin	-0.03485	0.06874	0.15764
Unemployment_Rate	-0.02139	-0.04513	-0.04162
Veteran_Population	5.32E-07	6.95E-07	0.0000014**
elig_pool	-0.00000139	-7.15E-07	-7.29E-07
Military	0.35303	0.8394	0.46718
Navy	0.00099189	0.00133	0.00172
Army	0.00145	-0.00285**	-0.00224
USMC	0.00137	0.00534*	-0.00211
Air_Force	-0.00592	-0.00389	-0.00532
Dep. Var. Mean	1.5778	1.4027	1.3570
F-stat	2.93	2.96	2.8
p-value	<.0001	<.0001	<.0001
DF	986	986	986
R sq	0.079	0.0796	0.0757
Adj R sq	0.0521	0.0527	0.0487

***-significant at 1% level, **-significant at 5% level, *- significant at 10% level

Based on the F-value, all the models are statistically significant (p<.0001), but the R squared drops in the model for the last six months. RAB score is statistically significant at the .01 level in all three models. The coefficient for RAB score drops over the periods,

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suggesting that, over time, individuals are moving along the learning curve; the longer they are on the job, the less the effect of RAB on actual contract production. The variables that are significant also change in the models. The first six-month period model has only three variables that are significant. The models for the second and last six-month period have eight variables that are statistically significant. RAB score is the only variable that is statistically significant in all three models. Thus, RAB score predicts success in all phases of a recruiter's career.

The first six-month period is from April 2003 to September 2003. This is a period of relatively easy recruiting, since high school students graduate during this time. Since this is a time of easy recruiting, it is expected that the predictive power of many of the explanatory variables is diluted. This is the only model in which being married is statistically significant and has a positive effect. Another curious finding is that AFQT Category I has a significant and negative impact on average production during the first six-month period.

The second six-month period is from October 2003 to March 2004. This is a time of the year when recruiting would probably be more difficult, since there is no influx of recent high school graduates as in the spring and summer months. Due to recruiting being more difficult during this period, the individual characteristics offer more explanatory power. This model does have the highest R-squared of the three models and eight significant variables. Also of note, the variables for Army and Marine

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Corps recruiters are significant, Army having a negative impact and Marine Corps recruiters having a positive impact.

The last six-month interval is between April 2004 and September 2004. The results from this model are interesting in that they are so different from the same portion of the year as in model one, which represents the recruiters' first six months of duty. None of the same variables are significant except RAB score. This may be due to the learning curve effect. That is, the recruiters have learned how to recruit more effectively, which reduces the effects of the RAB score and increases the importance of other factors. Having some college or more education has a negative impact on average production.

Table 12 compares the results from all of the models estimated in this study. Seen in Table 12, RAB score is the most consistently significant variable and always at the .01 level. It also has the most consistent value for its coefficient, ranging from .005 to .007. Furthermore, it provides the majority of explanatory power in the models. Other explanatory variables, such as NRD-level characteristics or individual demographics, have little effect on the significance and magnitude of RAB score. This tends to confirm that the RAB is singularly powerful in capturing factors important to being a successful recruiter.

Table 12. Comparison of Models

Model	Baseline Model	Model with NRD Characteristics	Model with Demographic Char.	Model with NRD and Demo	Log-Log Model	first six months	second six months	last six months
F-stat	58.79	7.83	5.39	4.21	3.45	2.93	2.96	2.8
p-value	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
DF	986	986	986	986	986	986	986	986
R sq	0.0563	0.0673	0.1004	0.1096	0.0917	0.079	0.0796	0.0757
Adj R sq	0.0554	0.0587	0.0818	0.0836	0.0651	0.0521	0.0527	0.0487
Intercept	0.33065	-0.07114	0.51917	0.31695	-5.11078	0.09314	0.16569	0.69204
total_sc	0.00671	0.00671	0.00638	0.00639	0.64457	0.00761	0.00616	0.00541
female	-	-	-0.04969	-0.05999	-0.02615	0.0205	-0.10514	-0.09533
black	-	-	0.01298	0.02019	-0.01701	-0.00992	0.03507	0.03543
Hisp	-	-	0.10322	0.108	0.07483	0.07491	0.08941	0.15967
other	-	-	0.23318	0.23666	0.14498	0.09703	0.14345	0.46949
married	-	-	0.04683	0.03904	0.03719	0.09319	0.00914	0.01479
nontrad	-	-	0.01704	0.01362	0.03678	0.09044	-0.09988	0.0503
coll	-	-	-0.06503	-0.07308	-0.04837	0.08261	-0.00042065	-0.30144
cat1	-	-	-0.15119	-0.14438	-0.06591	-0.30481	-0.06778	-0.06056
cat3A	-	-	-0.07758	-0.07949	-0.05566	-0.05864	-0.04326	-0.13657
cat3B	-	-	-0.10178	-0.10594	-0.07713	-0.08454	-0.1387	-0.09458
cat4	-	-	-0.13088	-0.1402	-0.06567	-0.11202	-0.23177	-0.07679
E4	-	-	-0.02727	-0.01356	0.01042	-0.01882	0.00354	-0.02539
E6	-	-	-0.14531	-0.14879	-0.17518	-0.091	-0.13574	-0.21962
ops	-	-	-0.11641	-0.1113	-0.07143	-0.09745	-0.10759	-0.12887
eng	-	-	-0.16607	-0.1592	-0.13104	-0.08666	-0.14212	-0.24883
supp	-	-	-0.0562	-0.05093	-0.03404	0.03372	-0.08375	-0.10276
cb	-	-	-0.16195	-0.1452	-0.10889	-0.2167	-0.12765	-0.09125
intel	-	-	-0.03808	-0.03652	-0.00132	-0.06749	-0.0027	-0.03937
admin	-	-	0.04525	0.06384	0.04809	-0.03485	0.06874	0.15764
Unemployment_Rate	-	-0.03759	-	-0.03605	-0.17539	-0.02139	-0.04513	-0.04162
Veteran_Population	-	8.54E-07	-	8.75E-07	0.37765	5.32E-07	6.95E-07	0.0000014
elig_pool	-	-7.05E-07	-	-9.44E-07	-0.09656	-0.00000139	-7.15E-07	-7.29E-07
Military	-	0.82708	-	0.5532	0.23244	0.35303	0.8394	0.46718
Navy	-	0.0017	-	0.00135	0.17033	0.00099189	0.00133	0.00172
Army	-	-0.0019	-	-0.00121	-0.27633	0.00145	-0.00285	-0.00224
USMC	-	0.00277	-	0.00153	0.00453	0.00137	0.00534	-0.00211
Air_Force	-	-0.00582	-	-0.00504	-0.14183	-0.00592	-0.00389	-0.00532

Note: Numbers in bold are statistically significant (at least 10% level)

V.   SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

A.   SUMMARY

This thesis examines the history and development of the Recruiter Assessment Battery, reviewing several works that tracked the validation of instruments that were used in its initial development. The studies indicate that the RAB can aid in selecting Navy recruiters. Further, models were estimated in this thesis to see if there was a relationship between average monthly production and recruiters' RAB scores, personal demographic characteristics, and NRD characteristics.

The first model estimated was a linear regression of average monthly production on the individual's RAB score. This model shows that a statistically significant and positive relationship exists between a recruiter's RAB score and productivity in this sample of recruiters. The estimated coefficient of RAB score had a value of .00671 and was significant at the .01 level. The model predicted that a person who scores 10 points higher on the RAB than the average recruiter will recruit .06 more people per month (or .8 more per year), almost one more additional person during a typical year.

A model was estimated using RAB score and NRD characteristics as explanatory variables to see if the characteristics of an NRD would affect the explanatory power of RAB score. The contribution of the NRD characteristics in the model was small and had no impact on the significance or value of the RAB score. The variables measuring veteran population and number of Navy recruiters in the NRD were significant and had a positive effect.

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The next step was to estimate a model using RAB score and personal characteristics of the recruiter as explanatory variables. The value of RAB score in this model dropped only slightly from .00671 to .00638 and remained significant at the .01 level. Several demographic factors were found to be significant. For example, the variables for Hispanic and 'other' race were significant and had a positive effect on recruiter production. The variables Cat3B, E6, operations ratings, engineering ratings, and Seabee ratings had a significant and negative impact on average monthly production. Not taking into account personal demographic characteristics may be one source of misclassification of recruiters when the classification procedure relies solely on RAB scores.

The next model estimated used RAB score, NRD-level characteristics, and personal characteristics as explanatory variables. The value and significance of RAB score remained practically the same, .00639, and was significant at the .01 level. The magnitude and significance of the other variables remained the same as in previous models.

A log-log model specification was estimated to see the relative magnitude of the effects of the independent variables. RAB score had the largest effect of any independent variable on average monthly production. A 10-percent increase in RAB score yielded a 6.4 percent increase in average production in this model.

To account for the learning curve and seasonal effects in recruiting, three models were estimated using the same explanatory variables but with average monthly production for the first six months, second six months, and last six

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months of the 18-month period as the dependent variables. RAB score was significant at the .01 level in all three models. Its value did drop over the six-month intervals from .00761 to .00541. This indicates that the effect of RAB score does diminish somewhat as recruiters move along the learning curve. The model for the first six-month period from April to September 2003 had only three significant variables. The model for the second six-month period had the highest R-squared and eight significant variables. This period is from October 2003 to March 2004, and is a more difficult period for recruiting without the influx of high school graduates. Due to this pattern, individual characteristics had a greater effect in this model. The model for the last six-month period also has eight significant variables that may indicate that the recruiters have learned how to recruit more effectively, with other factors explaining more, and the RAB explaining less, about recruiter productivity.

B. CONCLUSIONS

The objective of this thesis was to assess the predictive ability of the RAB. Recruiters' productivity was compared to their RAB scores, demographic characteristics, and NRD characteristics using multivariate models. Models were estimated to determine the relationship between RAB score and recruiter productivity. This analysis also looked for possible causes of recruiter misclassification (e.g., a bad prediction), and tried to determine ways of improving the RAB, based on the results of the models.

Given the positive relationship of the RAB score to average production in all of the models in this study, it seems the RAB is a consistent and reliable predictor of individual productivity in recruiting duty. The explanatory power of RAB score was affected very little by the inclusion of other variables in the models. RAB score was the only variable significant in all models at the .01 level. It also provided the greatest amount of explanatory power in the models.

Evidence was found suggesting that personal characteristics might cause the RAB to misclassify an individual when only the RAB score is used to classify individuals. The CNRC study in 2004 predicted the correct performance quartile for 30 percent of the recruiters in the sample. Thus, the predicted quartile for the majority, 70 percent, was predicted incorrectly. Part of the error may be due to the personal characteristics of the individuals not being taken into account in the original classification study. The CNRC study only compared the recruiters' performance quartile to their predicted RAB quartile. The differences in personal characteristics between the recruiters were not controlled in the CNRC analysis. All recruiters were treated as the same, and predictions were made based on their RAB score alone. The regression models estimated in this thesis included personal demographic characteristics. These personal attributes accounted for roughly half of the explanatory power in the models that include them while affecting the value and significance of the RAB score coefficient very little.

Other differences between this study and the CNRC study were also found that might also affect the predictive power of the RAB. This study removed E7 and above from the sample, whereas the CNRC study included this group in their sample. The CNRC study excluded months where recruiters had zero contracts, whereas this study included months of zero production.

Personal factors that appear to affect the RAB's predictive accuracy are being Hispanic or 'other' race, being an E6, and being in an operations or engineering rating. Being Hispanic and 'other' race had a positive effect on average monthly production and were significant in three and four of the six models, respectively. This may cause the RAB to underestimate the potential of recruiters of Hispanic and 'other' race compared with those who are white. Being an E6 and being in an operations or engineering rating had a significant and negative effect on average monthly production in five of the six models. Thus, these variables or attributes may cause the RAB test, by itself, to overestimate a recruiter's productivity potential compared to being an E5, or being in an aviation rating.

In other words, a high or low RAB score for people in these categories may not indicate accurately their potential to be successful. For example, if one is an E6, this has a negative effect on recruiter production, compared with an E5, all else held equal. Since part of this is probably due to the greater amount of supervisory and administrative duties that E6s perform, the score achieved by an E6 on the RAB may not be as meaningful as that achieved by an E5. It might be possible to use these

and other attributes to adjust the score of an individual to better predict productivity.

The effects of the NRD-level characteristics were very small. This could be due to the small amount of variation in the data, which only contained 31 different values. It may also be related to how the Navy assigns recruiting goals, recruiters, and other resources to NRDs. Using more local data, such as at the station level, might increase the predictive power of these variables.

C.   RECOMMENDATIONS

Based on the findings in this thesis several recommendations are provided. The first is that the study should be replicated in a period when recruiting is more difficult. This would create more separation between the recruiters who have higher ability and those who have lower ability, so that the effects of RAB score and other personal attributes can be assessed more precisely. Also, using NRD characteristics collected at a more local level would add variation to the geographic characteristics and, more importantly, represent the area where the recruiter is actually working more accurately. Prior performance could also be taken into account by using the sailors' evaluation trait averages.

It is also recommended that further research be done to see if other factors that were significant could be incorporated in the scoring of the RAB. For example, a weighting system or index might be developed to account for other personal factors that were significant, such as rating or rank. The sailor's RAB score could be adjusted based on these characteristics to more accurately represent

their potential in recruiting. To illustrate, since being an E6 had a negative impact on production, an E6's score could be adjusted or treated differently when using the RAB to select recruiters. This might mean that an E6 would be required to score higher on the RAB than, say, an E5.

The present study supports using the RAB as part of the recruiter selection process. Given the positive relationship found here and previous validation studies, the RAB could provide another valuable assessment of a sailor's potential to be a recruiter. The RAB could be implemented by requiring all sailors to take the test when they are promoted to E4 or when they reenlist. Since it is an online instrument, it could be administered at relatively low cost to a large number of personnel. Indeed, it could be administered even if scores were not initially used in selection. This would provide a source of data for those selected to serve on recruiting duty that could be used in other studies to further validate the RAB.

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APPENDIX CORRELATION COEFFICIENTS FOR VARIABLES USED IN MODELS

	avgprod	total_sc	female	white	black	Hisp
avgprod	1.000	0.237	-0.030	-0.083	-0.020	0.067
total_sc	0.237	1.000	-0.051	-0.109	0.079	0.035
female	-0.030	-0.051	1.000	-0.076	0.134	-0.004
white	-0.083	-0.109	-0.076	1.000	-0.576	-0.511
black	-0.020	0.079	0.134	-0.576	1.000	-0.212
Hisp	0.067	0.035	-0.004	-0.511	-0.212	1.000
other	0.096	0.038	-0.054	-0.318	-0.132	-0.117
married	0.032	0.035	-0.116	0.058	-0.051	-0.015
nontrad	0.035	0.044	-0.070	0.015	-0.083	0.066
HS	-0.019	-0.046	0.069	0.016	0.081	-0.054
coll	0.001	0.017	-0.032	-0.047	-0.024	-0.010
cat1	-0.070	-0.055	0.003	0.066	-0.091	-0.003
cat2	0.011	-0.098	-0.008	0.237	-0.215	-0.051
cat3A	0.008	0.037	0.012	0.019	-0.028	0.011
cat3B	0.003	0.088	0.014	-0.243	0.240	0.074
cat4	-0.039	-0.022	-0.049	-0.059	0.118	-0.052
E4	-0.005	-0.020	0.059	-0.057	0.075	0.005
E5	0.113	0.062	0.003	-0.033	-0.025	0.067
E6	-0.121	-0.054	-0.045	0.076	-0.025	-0.077
air	0.091	0.017	-0.038	-0.012	-0.028	0.042
ops	-0.023	0.021	-0.027	0.101	-0.060	-0.042
eng	-0.078	-0.020	-0.065	-0.054	0.026	0.014
supp	0.016	-0.035	0.041	-0.141	0.131	-0.019
cb	-0.034	-0.010	-0.018	0.055	-0.037	-0.019
intel	0.005	-0.016	0.114	0.036	-0.027	0.005
admin	0.040	0.024	0.135	-0.029	0.053	0.021
Unemploy_Rate	-0.041	0.010	-0.008	-0.134	-0.004	0.121
Vet_Pop	0.027	0.012	0.003	0.006	0.030	-0.056
elig_pool	0.013	0.029	-0.019	-0.197	0.066	0.151
Military	0.006	0.046	0.000	-0.073	0.033	0.142
Navy	0.033	0.047	-0.014	-0.349	0.111	0.287
Army	0.008	0.055	-0.016	-0.253	0.114	0.209
USMC	0.023	0.023	-0.020	-0.201	0.001	0.212
Air_Force	-0.008	0.034	-0.016	-0.108	0.070	0.067

	other	married	nontrad	HS	coll	cat1
avgprod	0.096	0.032	0.035	-0.019	0.001	-0.070
total_sc	0.038	0.035	0.044	-0.046	0.017	-0.055
female	-0.054	-0.116	-0.070	0.069	-0.032	0.003
white	-0.318	0.058	0.015	0.016	-0.047	0.066
black	-0.132	-0.051	-0.083	0.081	-0.024	-0.091
Hisp	-0.117	-0.015	0.066	-0.054	-0.010	-0.003
other	1.000	-0.012	0.005	-0.080	0.144	0.017
married	-0.012	1.000	0.043	-0.026	-0.012	0.030
nontrad	0.005	0.043	1.000	-0.808	-0.048	-0.029
HS	-0.080	-0.026	-0.808	1.000	-0.512	0.008
coll	0.144	-0.012	-0.048	-0.512	1.000	0.034
cat1	0.017	0.030	-0.029	0.008	0.034	1.000
cat2	-0.054	0.001	-0.059	0.029	0.018	-0.141
cat3A	-0.009	0.011	0.134	-0.130	0.044	-0.095
cat3B	-0.006	-0.033	-0.021	0.071	-0.091	-0.138
cat4	0.008	0.047	-0.044	0.055	-0.028	-0.030
E4	-0.014	-0.084	-0.016	-0.003	0.018	-0.064
E5	0.006	-0.052	0.070	-0.026	-0.041	-0.173
E6	0.003	0.116	-0.065	0.030	0.032	0.234
air	0.006	-0.039	0.059	-0.053	0.005	-0.048
ops	-0.045	-0.001	-0.050	0.024	0.049	-0.017
eng	0.044	0.007	-0.018	0.019	-0.038	0.059
supp	0.098	0.011	-0.004	0.032	-0.045	-0.024
cb	-0.023	0.038	0.032	-0.018	-0.011	-0.042
intel	-0.037	0.021	0.041	-0.044	0.023	0.128
admin	-0.056	-0.004	-0.037	0.037	-0.006	-0.039
Unemploy_Rate	0.094	-0.059	0.041	-0.025	-0.020	0.022
Vet_Pop	0.022	0.000	0.028	-0.017	-0.005	0.011
elig_pool	0.064	-0.044	0.084	-0.073	0.015	-0.035
Military	-0.115	0.008	-0.096	0.074	0.009	-0.010
Navy	0.095	-0.001	0.044	-0.029	0.001	-0.036
Army	0.014	-0.031	-0.021	0.022	-0.002	-0.022
USMC	0.086	-0.013	0.069	-0.050	-0.002	-0.043
Air_Force	0.005	0.020	-0.022	0.033	-0.022	-0.011

	cat2	cat3A	cat3B	cat4	E4	E5
avgprod	0.011	0.008	0.003	-0.039	-0.005	0.113
total_sc	-0.098	0.037	0.088	-0.022	-0.020	0.062
female	-0.008	0.012	0.014	-0.049	0.059	0.003
white	0.237	0.019	-0.243	-0.059	-0.057	-0.033
black	-0.215	-0.028	0.240	0.118	0.075	-0.025
Hisp	-0.051	0.011	0.074	-0.052	0.005	0.067
other	-0.054	-0.009	-0.006	0.008	-0.014	0.006
married	0.001	0.011	-0.033	0.047	-0.084	-0.052
nontrad	-0.059	0.134	-0.021	-0.044	-0.016	0.070
HS	0.029	-0.130	0.071	0.055	-0.003	-0.026
coll	0.018	0.044	-0.091	-0.028	0.018	-0.041
cat1	-0.141	-0.095	-0.138	-0.030	-0.064	-0.173
cat2	1.000	-0.388	-0.562	-0.122	-0.123	-0.052
cat3A	-0.388	1.000	-0.380	-0.083	0.011	0.082
cat3B	-0.562	-0.380	1.000	-0.119	0.166	0.081
cat4	-0.122	-0.083	-0.119	1.000	-0.055	-0.090
E4	-0.123	0.011	0.166	-0.055	1.000	-0.448
E5	-0.052	0.082	0.081	-0.090	-0.448	1.000
E6	0.142	-0.097	-0.204	0.137	-0.206	-0.783
air	-0.097	0.030	0.095	-0.026	0.009	0.058
ops	0.256	-0.054	-0.172	-0.063	-0.105	0.004
eng	-0.079	-0.013	0.033	0.080	0.008	-0.025
supp	-0.098	0.003	0.100	0.012	0.022	0.048
cb	-0.061	0.050	0.033	-0.006	0.078	-0.036
intel	0.028	-0.009	-0.062	-0.034	-0.040	-0.026
admin	-0.084	0.044	0.047	0.063	0.144	-0.072
Unemploy_Rate	-0.045	-0.011	0.057	-0.063	0.034	-0.001
Vet_Pop	-0.028	0.026	0.002	-0.036	-0.083	0.053
elig_pool	-0.093	0.067	0.052	-0.061	0.051	0.056
Military	-0.025	-0.024	0.049	0.060	0.057	-0.017
Navy	-0.153	0.048	0.100	0.013	-0.012	0.031
Army	-0.146	0.049	0.089	0.044	-0.013	0.035
USMC	-0.091	0.056	0.053	-0.030	-0.005	0.082
Air_Force	-0.043	0.016	0.019	0.010	-0.057	0.049

	E6	air	ops	eng	supp	cb
avgprod	-0.121	0.091	-0.023	-0.078	0.016	-0.034
total_sc	-0.054	0.017	0.021	-0.020	-0.035	-0.010
female	-0.045	-0.038	-0.027	-0.065	0.041	-0.018
white	0.076	-0.012	0.101	-0.054	-0.141	0.055
black	-0.025	-0.028	-0.060	0.026	0.131	-0.037
Hisp	-0.077	0.042	-0.042	0.014	-0.019	-0.019
other	0.003	0.006	-0.045	0.044	0.098	-0.023
married	0.116	-0.039	-0.001	0.007	0.011	0.038
nontrad	-0.065	0.059	-0.050	-0.018	-0.004	0.032
HS	0.030	-0.053	0.024	0.019	0.032	-0.018
coll	0.032	0.005	0.049	-0.038	-0.045	-0.011
cat1	0.234	-0.048	-0.017	0.059	-0.024	-0.042
cat2	0.142	-0.097	0.256	-0.079	-0.098	-0.061
cat3A	-0.097	0.030	-0.054	-0.013	0.003	0.050
cat3B	-0.204	0.095	-0.172	0.033	0.100	0.033
cat4	0.137	-0.026	-0.063	0.080	0.012	-0.006
E4	-0.206	0.009	-0.105	0.008	0.022	0.078
E5	-0.783	0.058	0.004	-0.025	0.048	-0.036
E6	1.000	-0.070	0.069	0.022	-0.068	-0.015
air	-0.070	1.000	-0.398	-0.298	-0.140	-0.122
ops	0.069	-0.398	1.000	-0.399	-0.187	-0.163
eng	0.022	-0.298	-0.399	1.000	-0.140	-0.122
supp	-0.068	-0.140	-0.187	-0.140	1.000	-0.057
cb	-0.015	-0.122	-0.163	-0.122	-0.057	1.000
intel	0.056	-0.115	-0.154	-0.115	-0.054	-0.047
admin	-0.021	-0.113	-0.152	-0.114	-0.053	-0.047
Unemploy_Rate	-0.023	-0.010	-0.025	0.019	0.025	0.000
Vet_Pop	-0.001	0.014	-0.029	0.024	0.035	-0.037
elig_pool	-0.096	0.055	-0.083	0.012	0.098	-0.035
Military	-0.022	0.041	-0.009	-0.053	-0.042	0.022
Navy	-0.026	0.037	-0.095	0.060	0.082	-0.030
Army	-0.029	0.010	-0.095	0.060	0.065	-0.013
USMC	-0.087	0.000	-0.052	0.042	0.082	-0.016
Air_Force	-0.014	-0.028	-0.018	0.048	0.013	0.010

	intel	admin	Unemploy Rate	Vet Pop	elig_pool
avgprod	0.005	0.040	−0.041	0.027	0.013
total_sc	−0.016	0.024	0.010	0.012	0.029
female	0.114	0.135	−0.008	0.003	−0.019
white	0.036	−0.029	−0.134	0.006	−0.197
black	−0.027	0.053	−0.004	0.030	0.066
Hisp	0.005	0.021	0.121	−0.056	0.151
other	−0.037	−0.056	0.094	0.022	0.064
married	0.021	−0.004	−0.059	0.000	−0.044
nontrad	0.041	−0.037	0.041	0.028	0.084
HS	−0.044	0.037	−0.025	−0.017	−0.073
coll	0.023	−0.006	−0.020	−0.005	0.015
cat1	0.128	−0.039	0.022	0.011	−0.035
cat2	0.028	−0.084	−0.045	−0.028	−0.093
cat3A	−0.009	0.044	−0.011	0.026	0.067
cat3B	−0.062	0.047	0.057	0.002	0.052
cat4	−0.034	0.063	−0.063	−0.036	−0.061
E4	−0.040	0.144	0.034	−0.083	0.051
E5	−0.026	−0.072	−0.001	0.053	0.056
E6	0.056	−0.021	−0.023	−0.001	−0.096
air	−0.115	−0.113	−0.010	0.014	0.055
ops	−0.154	−0.152	−0.025	−0.029	−0.083
eng	−0.115	−0.114	0.019	0.024	0.012
supp	−0.054	−0.053	0.025	0.035	0.098
cb	−0.047	−0.047	0.000	−0.037	−0.035
intel	1.000	−0.044	−0.027	0.018	−0.040
admin	−0.044	1.000	0.036	−0.032	0.014
Unemploy_Rate	−0.027	0.036	1.000	0.022	0.380
Vet_Pop	0.018	−0.032	0.022	1.000	0.529
elig_pool	−0.040	0.014	0.380	0.529	1.000
Military	0.026	0.049	−0.162	−0.461	−0.253
Navy	−0.060	0.015	0.306	0.341	0.695
Army	−0.032	0.046	0.136	0.502	0.637
USMC	−0.052	0.006	0.371	0.566	0.843
Air_Force	−0.007	−0.018	0.144	0.671	0.488

	Military	Navy	Army	USMC	Air_Force
avgprod	0.006	0.033	0.008	0.023	-0.008
total_sc	0.046	0.047	0.055	0.023	0.034
female	0.000	-0.014	-0.016	-0.020	-0.016
white	-0.073	-0.349	-0.253	-0.201	-0.108
black	0.033	0.111	0.114	0.001	0.070
Hisp	0.142	0.287	0.209	0.212	0.067
other	-0.115	0.095	0.014	0.086	0.005
married	0.008	-0.001	-0.031	-0.013	0.020
nontrad	-0.096	0.044	-0.021	0.069	-0.022
HS	0.074	-0.029	0.022	-0.050	0.033
coll	0.009	0.001	-0.002	-0.002	-0.022
cat1	-0.010	-0.036	-0.022	-0.043	-0.011
cat2	-0.025	-0.153	-0.146	-0.091	-0.043
cat3A	-0.024	0.048	0.049	0.056	0.016
cat3B	0.049	0.100	0.089	0.053	0.019
cat4	0.060	0.013	0.044	-0.030	0.010
E4	0.057	-0.012	-0.013	-0.005	-0.057
E5	-0.017	0.031	0.035	0.082	0.049
E6	-0.022	-0.026	-0.029	-0.087	-0.014
air	0.041	0.037	0.010	0.000	-0.028
ops	-0.009	-0.095	-0.095	-0.052	-0.018
eng	-0.053	0.060	0.060	0.042	0.048
supp	-0.042	0.082	0.065	0.082	0.013
cb	0.022	-0.030	-0.013	-0.016	0.010
intel	0.026	-0.060	-0.032	-0.052	-0.007
admin	0.049	0.015	0.046	0.006	-0.018
Unemploy_Rate	-0.162	0.306	0.136	0.371	0.144
Vet_Pop	-0.461	0.341	0.502	0.566	0.671
elig_pool	-0.253	0.695	0.637	0.843	0.488
Military	1.000	-0.048	0.131	-0.235	-0.052
Navy	-0.048	1.000	0.796	0.795	0.592
Army	0.131	0.796	1.000	0.752	0.773
USMC	-0.235	0.795	0.752	1.000	0.661
Air_Force	-0.052	0.592	0.773	0.661	1.000

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